Amendments to the Claims:

This listing of claims will replace all prior versions, and listings, of claims in the application:

Listing of Claims:

Claim 1 (currently amended): An image matching method for performing a matching images to linear components in a first image and a second image, the method comprising:

a position correction step, performed by a position correction means, of performing a position correction processing to the first image and the second image;

a first step, performed after the position correction step and by a transformation means, of performing an image processing for ~~performing~~ transforming points in each image of the first image and the second image to a curved pattern and the linear components in each image to a plurality of overlapped curved-patterns, based on a distance from a reference position to a shortest point in a straight line passing through a point in the image and an angle between a straight line passing though the reference position and the shortest point and a reference axis including the reference position, and generating a first transformed image and a second transformed image, wherein the image processing is performed to the first image and the second image which are results of the position correction processing in the position correction step to generate the first transformed image and the second transformed image, and

a second step, performed by a matching means, of performing a matching of the first image and the second image based on a degree of an overlap of the patterns in the first transformed image and the second transformed image generated in the first step and a matching or mismatching of the patterns in the first and second transformed images.

Claim 2 (original): An image matching method as set forth in claim 1, wherein the first step comprises a third step of extracting regions each of which indicates a degree of the overlap of the curved patterns in the transformed image equal to or greater than a threshold set in advance, from the first transformed image and the second transformed image, and

wherein, in the second step, the matching of the first image and the second image are carried out based on the matching or mismatching of the patterns in the regions extracted from the first transformed image and the second transformed image respectively in the third step.

Claim 3 (original):   An image matching method as set forth in claim 2, wherein, in the third step, the threshold is determined based on a size of the extracted region such that the size of the extracted region is larger than the set value.

Claim 4 (original):   An image matching method as set forth in claim 2, wherein, in the third step, the threshold is determined based on the size of the extracted region such that the size of the extracted region is within the set value.

Claim 5 (original):   An image matching method as set forth in claim 2, wherein in the third step, the image is deleted when the size of the extracted region is less than the set value.

Claim 6 (original):   An image matching method as set forth in claim 1, wherein, in the first step, a Hough transform processing is performed to the first image and the second image to generate the first transformed image and the second transformed image.

Claim 7 (original):   An image matching method as set forth in claim 1, wherein, in the second step, a comparison processing is performed to a plurality of different positional relationships in the first transformed image and the second transformed image generated in the first step, a similarity as a correlation value is generated based on a result of the comparison processing, and the matching of the first image and the second image are carried out based on the generated similarity.

Claim 8 (canceled).

Claim 9 (currently amended): An image matching method as set forth in claim ~~81~~1, wherein, in the ~~tenth~~ position correction step, as the position correction processing, a correlation value is generated based on a phase component which is a result of a rotation angle correction processing or an enlargement ratio correction processing and the Fourier transform processing to the first image and the second image, and the position correction processing is performed to the first image and the second image based on the generated correlation value.

Claim 10 (currently amended): An image matching method as set forth in claim ~~81~~1, wherein, in the ~~tenth~~ position correction step, a plurality of the correlation value indicating a corrected position is generated by a correlation processing to the first image and the second image, and a plurality of the position correction processing is performed to the first image and the second image based on the generated correlation value,

in the first step, the image processing is performed to the results of the plurality of the position correction processing of the first image and the second image in the ~~tenth~~ position correction step to generate the first transformed image and the second transformed image, and

in the second step, the correlation value is generated based on the patterns in the first transformed image and the second transformed image generated in the first step, and the matching of the first image and the second image are carried out based on the generated correlation value and the threshold set in advance.

Claim 11 (original): An image matching method as set forth in claim 10, wherein, in the second step, the matching of the first image and the second image are carried out to the result of the plurality of the position correction processing generated in the first step based on the total amount of the correlation value corresponding to different positions and the threshold set in advance.

Claim 12 (withdrawn):   An image matching method for performing a matching images to linear components in a first image and a second image, the method comprising:

a first step of performing a Hough transform processing to the first image and the second image to generate a first transform image and a second transform image, and

a second step of performing a matching of the first image and the second image based on a degree of an overlap of patterns in the first transformed image and the second transformed image generated in the first step and a matching or mismatching of the patterns in the same.

Claim 13 (currently amended):   An image matching apparatus performing a matching to linear components in a first image and a second image, the apparatus comprising:

a position correction means for performing a position correction processing to the first image and the second image;

a transform means for performing an image processing to the first image and the second image after the position correction processing, the image processing by which points in each image are transformed to a curved pattern and linear components in each image are transformed to a plurality of overlapped curved-patterns based on a distance from a reference position to a shortest point in a straight line passing through a point in the image and an angle between a straight line passing though the reference position and the shortest point and a reference axis including the reference position, and generating a first transformed image and a second transformed image, wherein the transform means performs the image processing to results of the position correction processing of the first image and the second image performed by the position correction means to generate the first transformed image and the second transformed image, and

a matching means for performing a matching of the first image and the second image based on a degree of an overlap of the patterns in the first transformed image and the second transformed image generated by the transform means and a matching or mismatching of the patterns in the first and second transformed images.

Claim 14 (original):   An image matching apparatus as set forth in claim 13, further comprising a extraction means for extracting a region where the degree of the overlap of the

curved patterns in the transformed image is equal to or greater than a threshold set in advance, from the first transformed image and the second transformed image,

wherein the matching means performs the matching of the first image and the second image based on the matching or mismatching of the patterns in the regions extracted by the extraction means from the first transformed image and the second transformed image respectively.

Claim 15 (original): An image matching apparatus as set forth in claim 14, wherein the extraction means determines the threshold based on a size of the extracted region so as to be larger than the set value.

Claim 16 (original): An image matching apparatus as set forth in claim 14, wherein the extraction means determines the threshold based on the size of the extracted region so as to be within the set value.

Claim 17 (original): An image matching apparatus as set forth in claim 14, wherein the extraction means deletes the image when the size of the extracted region is equal to or less than the set value.

Claim 18 (original): An image matching apparatus as set forth in claim 13, wherein the transform means performs a Hough transform processing to the first image and the second image to generate the first transformed image and the second transformed image.

Claim 19 (original): An image matching apparatus as set forth in claim 13, wherein the matching means performs a comparison processing to a plurality of different positional relationships in the first transformed image and the second transformed image generated by the transform means, generates a similarity as a correlation value based on a result of the comparison processing, and performs the matching of the first image and the second image based on the generated similarity.

Claim 20 (canceled).

Claim 21 (currently amended):   An image matching apparatus as set forth in claim ~~20~~13, wherein the position correction means generates a correlation value based on a phase component which is a result of a rotation angle correction processing or an enlargement ratio correction processing and the Fourier transform processing to the first image and the second image, and performs the position correction processing to the first image and the second image based on the generated correlation value.

Claim 22 (currently amended):   An image matching apparatus as set forth in claim ~~20~~13, wherein the position correction means generates a plurality of the correlation values each indicating a corrected position by a correlation processing based on the first image and the second image, and performs a plurality of the position correction processing to the first image and the second image based on the generated correlation value,

the transform means performs the image processing to the results of the plurality of the position correction processing of the first image and the second image by the position correction means to generate the first transformed image and the second transformed image, and

the matching means generates the correlation value based on the patterns in the first transformed image and the second transformed image generated by the transform means, and performs the matching of the first image and the second image based on the generated correlation value and the threshold set in advance.

Claim 23 (original):   An image matching apparatus as set forth in claim 22, wherein the matching means performs the matching of the first image and the second image to the result of the plurality of the position correction processing generated by the transform means based on the total amount of the correlation value corresponding to different positions and the threshold set in advance.

Claim 24 (withdrawn):   An image matching apparatus performing a matching to linear components in a first image and a second image, the apparatus comprising:

7

a transform means for performing a Hough transform processing to the first image and the second image to generate a first transform image and a second transform image, and

a matching means for performing a matching of the first image and the second image based on a degree of an overlap of patterns in the first transformed image and the second transformed image generated by the transform means and a matching or mismatching of the patterns in the first and second transformed images.

Claim 25 (currently amended):   A computer readable medium storing a computer readable program for matching images to linear components in a first image and a second image, said computer readable program structured to cause an apparatus to perform: A program that causes an information processing device to perform a matching images to linear components in a first image and a second image, the program comprising:

a position correction routine for performing a position correction processing to the first image and the second image;

a first routine for performing an image processing to the first image and the second image, by which points in each image are transformed to a curved pattern and linear components in each image are transformed to a plurality of overlapped curved-patterns based on a distance from a reference position to a shortest point in a straight line passing through a point in the image and an angle between a straight line passing though the reference position and the shortest point and a reference axis including the reference position, and generating a first transformed image and a second transformed: image, wherein the image processing is performed to results of the position correction processing to the first image and the second image in the position correction routine to generate the first transformed image and the second transformed image, and

a second routine for performing a matching of the first image and the second image based on a degree of an overlap of the patterns in the first transformed image and the second transformed image generated in the first routine and a matching or mismatching of the patterns in the first and second transformed images.

Claim 26 (currently amended):   A computer readable medium storing a computer readable program A program as set forth in claim 25, in the first routine, further comprising a third routine for extracting regions each of which indicates a degree of the overlap of the curved patterns in the transformed image equal to or greater than a threshold set in advance, from the first transformed image and the second transformed image,

wherein, in the second routine, the matching of the first image and the second image are carried out based on the matching or mismatching of the patterns in the regions extracted from the first transformed image and the second transformed image respectively in the third routine.

Claim 27 (currently amended):   A computer readable medium storing a computer readable program A program as set forth in claim 26, wherein, in the third routine, the threshold is determined based on a size of the extracted region such that the size of the extracted region is larger than the set value.

Claim 28 (currently amended):   A computer readable medium storing a computer readable program A program as set forth in claim 26, wherein, in the third routine, the threshold is determined based on the size of the extracted region such that the size of the extracted region is within the set value.

Claim 29 (currently amended):   A computer readable medium storing a computer readable program A program as set forth in claim 26, wherein, in the third routine, the image is deleted when the size of the extracted region is equal to or less than the set value.

Claim 30 (currently amended):   A computer readable medium storing a computer readable program A program as set forth in claim 25, wherein, in the first routine, a Hough transform processing is performed to the first image and the second image to generate the first transformed image and the second transformed image.

Claim 31 (currently amended):   A computer readable medium storing a computer readable program A program as set forth in claim 25, wherein, in the second routine, a

9

comparison processing is performed to a plurality of different positional relationships in the first transformed image and the second transformed image generated in the first routine, a similarity as a correlation value is generated based on a result of the comparison processing, and the matching of the first image and the second image are carried out based on the generated similarity.

Claim 32 (canceled).

Claim 33 (currently amended): A computer readable medium storing a computer readable program A program as set forth in claim 3225, wherein, in the position correctiontenth routine, as the position correction processing, a correlation value is generated based on a phase component which is a result of a rotation angle correction processing or an enlargement ratio correction processing and the Fourier transform processing to the first image and the second image, and the position correction processing is performed to the first image and the second image based on the generated correlation value.

Claim 34 (currently amended): A computer readable medium storing a computer readable program A program as set forth in claim 3225, wherein, in the position correction tenth routine, a plurality of the correlation values each indicating a corrected position is generated by a correlation processing based on the first image and the second image, and a plurality of the position correction processing are performed to the first image and the second image based on the generated correlation value,

in the first routine, the image processing is performed to the results of the plurality of the position correction processing of the first image and the second image in the position correctiontenth routine to generate the first transformed image and the second transformed image, and

in the second routine, the correlation value is generated based on the patterns in the first transformed image and the second transformed image generated in the first routine, and the matching of the first image and the second image are carried out based on the generated correlation value and the threshold set in advance.

Claim 35 (currently amended): <u>A computer readable medium storing a computer readable program</u> A program as set forth in claim 34, wherein, in the second routine, the matching of the first image and the second image are carried out to the result of the plurality of the position correction processing generated in the first routine based on the total amount of the correlation value corresponding to different positions and the threshold set in advance.

Claim 36 (withdrawn): A program that causes an information processing device to perform a matching to linear components in a first image and a second image, the program comprising:

a first routine for performing a Hough transform processing to the first image and the second image to generate a first transform image and a second transform image, and

a second routine for performing a matching of the first image and the second image based on a degree of an overlap of patterns in the first transformed image and the second transformed image generated in the first routine and a matching or mismatching of the patterns in the first and second transformed images.